ME-5904

ME 5904

MADRID-STOA
8 NOV. 1978
DOCUMENTATION

WEINSCHEL ENGINEERING

MODEL AS-5A

TERFAC
Code 821.2
C.2

STDN ME-5904

WEINSCHEL ENGINEERING

PRECISION ATTENUATOR SET

MODEL AS-5A

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WEINSCHEL MODEL AS-5A PRECISION ATTENUATOR SET

SPECIFICATIONS

ATTENUATOR	1 db	2 db	3 db	6 db	10 db	20 db	40 db
FREQUENCY RANGE	← DC TO 5 GHz →			← DC TO 12.4 GHz →			
SWR (DC TO 4 GHz)	← 1.25:1 →						
(4 TO 12.4 GHz)	← 1.35:1 →						
(DC TO 12.4 GHz)							← 1.5:1 →
MAXIMUM DEVIATION	← ± 0.3 db →			← ± 5.0 % →			

POWER RATING : 2 WATTS AVERAGE ; 1 KW PEAK

POWER COEFFICIENT : $< .001 \ \frac{db}{db \times W}$

TEMPERATURE COEFFICIENT : $< .0001 \ \frac{db}{db \times {}^{o}C}$

CONNECTORS : SEMI-PRECISION TYPE N STAINLESS STEEL.

DESCRIPTION

THE SET CONSISTS OF SEVEN (7) WEINSCHEL MODEL 1 ATTENUATORS (ONE (1) EACH 1 db, 2 db, 3 db, 6 db, 10 db, 20 db, & 40 db VALUE). THE ITEMS ARE ENCLOSED IN A WOODEN CASE WITH LOCK.

NASA INSTRUMENT CALIBRATION PROCEDURE

FOR

COAXIAL FIXED ATTENUATOR

WEINSCHEL MODEL AS-5A

Procedure No. A-041

I. CALIBRATION PERIOD

See Table of Contents (Volume 1).

II. EQUIPMENT REQUIRED OR EQUIVALENT

Equipment	Manufacturer and Model	Required Range and Tolerance
Attenuator Calibrator	Weinschel VM-3	0 to -50 dbm ± .05 db @ 30 MHz
Oscilloscope	Tektronix 547	100 μsec to 1 msec/cm
Dual-Trace Preamplifier	Tektronix 1A1	0.1 V/cm
Heterodyne Mixer-Oscillator	Weinschel HO-1	0 to 50 dbm @ 30 MHz to 4.0 GHz
Attenuator (2 required)	Weinschel 530A	10 db, 1 watt
Signal Generator	Hewlett-Packard 608E	0 dbm @ 30 to 420 MHz
Signal Generator	Hewlett-Packard 8614A	0 dbm @ 1.0 GHz
Signal Generator	Hewlett-Packard 8616A	0 dbm @ 4.0 GHz

III. SPECIFICATIONS

Characteristics	Range	Accuracy
Frequency Range	AS-5A (1 db) AS-5A (2 db to 40 db)	DC to 5.0 GHz DC to 12.4 GHz
Maximum Deviation	AS-5A (1 db to 3 db) AS-5A (6 db to 40 db)	±0.3 db ±5% stated in db

NOTE

Because of limitations of test equipment available at the MSFN Depot Laboratory, the "AS-5A( )" will be calibrated at frequencies between 30 MHz and 4.0 GHz only.

IV. PREVENTIVE MAINTENANCE AND OR OPERATIONAL CHECK

A. Hereafter the instrument to be calibrated will be referred to as the "AS-5A( )".

B. Inspect the instrument for any obvious defects. Inspect the connectors for signs of brass filings or debris. Clean the connectors with a soft cloth and an approved grade of electrical solvent. Allow the connectors to dry before calibrating.

C. Follow the prerequisites outlined in paragraph V, and then perform the calibration outlined in paragraph VI.

V. PREREQUISITES

A. Verify that all instruments used in this calibration procedure display current calibration dates.

B. Connect all AC-operated instruments used in the calibration of this instrument to the AC power line and allow a warm-up and stabilization period.

VI. CALIBRATION PROCEDURE

A. Calibrate the Attenuation Accuracy: Refer to specifications in section III.

1. Set the Weinschel VM-3 MOD OUTPUT LEVEL control fully counter-clockwise, and connect the equipment as shown in figure A.

2. Set the Hewlett-Packard 608E controls for a 30-MHz output frequency at a 0-dbm level.

3. Set the Weinschel VM-3 and HO-1 controls for insertion loss measurements at 30 MHz.

4. Adjust the Weinschel VM-3 STANDARD ATTENUATOR COARSE and FINE controls for a balance on the AMPLITUDE BALANCE meter. Note the optical readout indication.

5. Set the Weinschel VM-3 AFF switch to the OFF position, and insert the "AS-5A(1 db)" attenuator in the insertion point indicated in figure A.

6. Set the Weinschel VM-3 AFF switch to the SLOW and FAST positions, and adjust the STANDARD ATTENUATOR COARSE and FINE controls for a balance indication on the AMPLITUDE BALANCE meter. Note the optical readout indication.

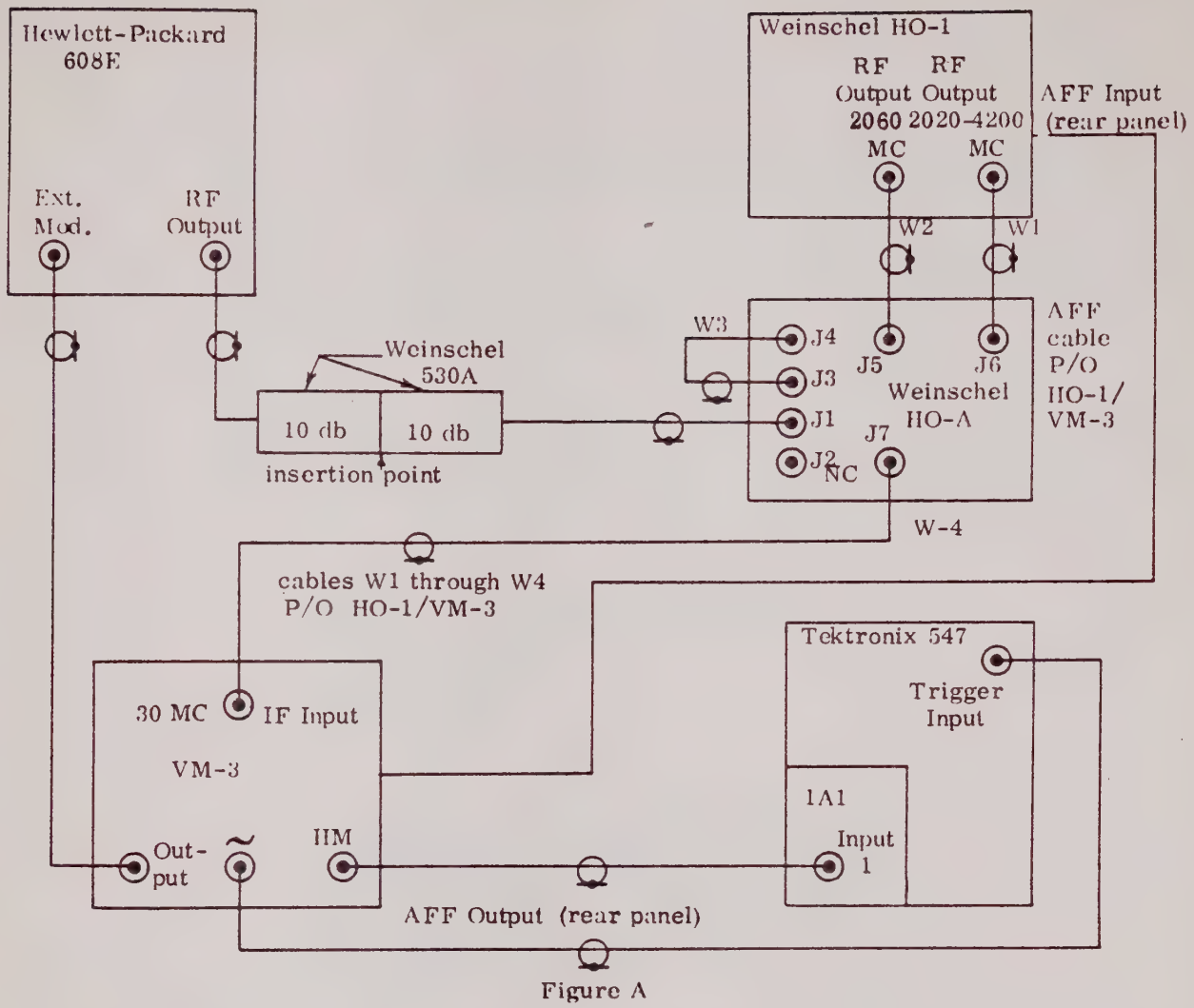


Figure A

7. The difference between the indications noted in steps A.4 and A.6 should be 1 db ± 0.3 db (limits: 0.7 to 1.3 db).

8. Repeat steps A.5 and A.6, inserting the "AS-5A( )" attenuators listed in table 1. The measured insertion loss for each attenuator should be within the limits stated in table 1.

Table 1

"AS-5A( )" Installed	Insertion Loss Limits		
	Low	Nominal	High
2 db	1.7 db	2.0 db	2.3 db
3 db	2.7 db	3.0 db	3.3 db
6 db	5.70 db	6.0 db	6.30 db
10 db	9.50 db	10.0 db	10.50 db
20 db	19.0 db	20.0 db	21.0 db
40 db	38.0 db	40.0 db	42.0 db

9. Repeat steps A.1 through A.8 with the Hewlett-Packard 608E set to the following frequencies: 136 MHz, 225 MHz, 260 MHz, 296 MHz, and 420 MHz.

10. Substitute the Hewlett-Packard 8614A for the Hewlett-Packard 608E, and set the FREQUENCY dial to 1000 MHz.

11. Repeat steps A.1 through A.8.

12. Substitute the Hewlett-Packard 8616A for the Hewlett-Packard 8614A, and set the FREQUENCY dial to 4000 MHz.

NOTE

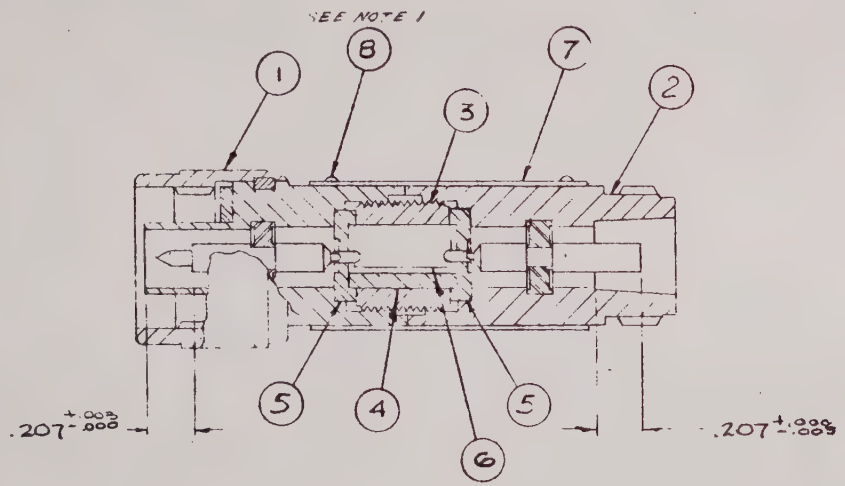
At 4.0 GHz, disconnect the cable from the Weinschel HO-A J1, and connect it to J3. Cable W3 will be connected to J2 and J4. J1 will be unterminated.

13. Repeat steps A.1 through A.8.

NOTE

If the "AS-5A( )" does not meet the specifications as outlined in this calibration procedure, take the necessary corrective action in accordance with the manufacturer's manual or NASA manual ME- and local laboratory practices, and repeat the applicable portions of this procedure.

B100-277 REV D



NOTES:
1. USING A #52 (.063") D.R.L. AND ITEM 7 AS A TEMPLATE, DRILL 2 HOLES IN ITEM 1, AND ITEM 2, 1/8 DEEP ± 1/64.

1&2 (41-80dB)	PL100-277-3
1&2 (21-40dB)	PL100-277-2
1&2 (1-20dB)	PL100-277-1
MODEL / DWG NO	PARTS LIST NO.
FOR PARTS LIST SEE	

APR _ 1968

REVISIONS

A	Rel. SCO 8/1/66 ADDED PIN SPRS.	MEC
B	REVISED 1-2-67 ITEM 8 WAS .174 25-40 CHANGED NOTE 1 WAS .093 DEEP	
C	ADDED -1 & -3 ASSYS. 6/16/67 RN-1-7	
D	REVISED IP 2-9-67 REMOVED PL 2000	

USED ON	ASSY. DRWG.

DIMENSIONS ARE IN INCHES
TOLERANCES
All 3 Place Decimal Dims. ± .003
All 2 Place Decimal Dims. ± .01
All Fractional Dims. ± 1/64
All Angles ± 1/2°
Unless Otherwise Specified

WEINSCHEL ENGINEERING
MANUFACTURERS CODE NO 93459
GAITHERSBURG, MARYLAND

MODEL 1 & MODEL 2
CARD ATTENUATOR
ASSEMBLY

MATERIAL
FINISH

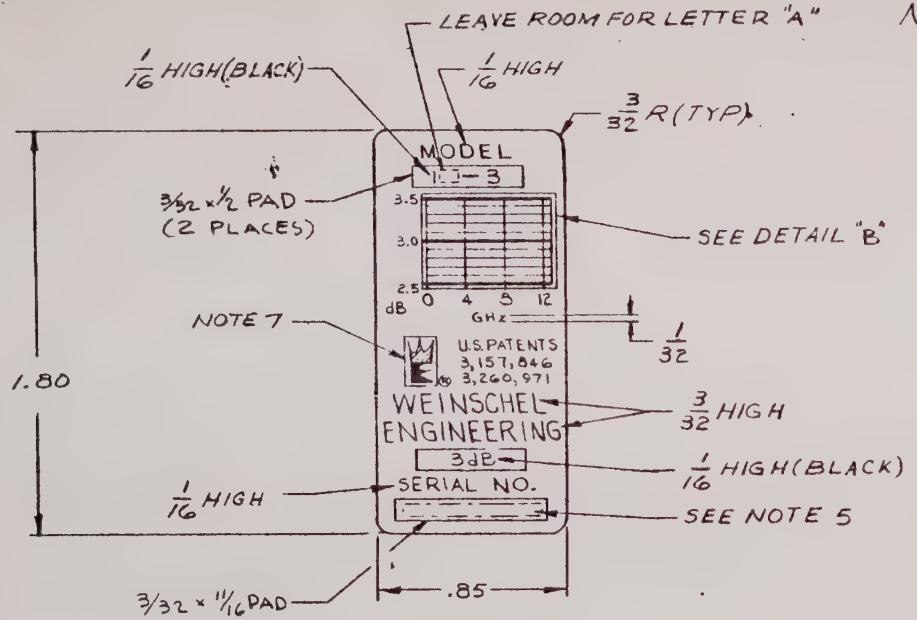
D JDT 7-25-66 | C [illegible] | SCALE 2:1
E | A | B100-277 | REV D

ITEM NO.	QTY REQD	CODE IDENT NO	PART NO	NOMENCLATURE				
1	1		ASK1062	MALE CONN. ASSY				
2	1		ASK1063	FEMALE CONN ASSY				
3	1		A100-250	BARREL				
4	1		A100-248-1	SPACER				
5	2		A100-249	END CAP				
6	1		B100-255-1	CARD ASSY				
7	1		B90-95	CALIBRATION PLATE				
8	4		74-55-1	SCREW, DRIVE, #0 x 1/8 LG				
			B89-236	MOD 1 INTERFACE CONT DWG				
			B89-396	MOD 2 INTERFACE CONT DWG				
			PTM #78					

PARTS LIST	WEINSCHEL ENGINEERING	REV DATE	PL100-277-1	REV
TITLE MODEL 1 & MODEL 2 ATTENUATOR ASSY	APPROVAL	ECN NO.	CODE IDENT NO. 93459	SH 2 OF 2

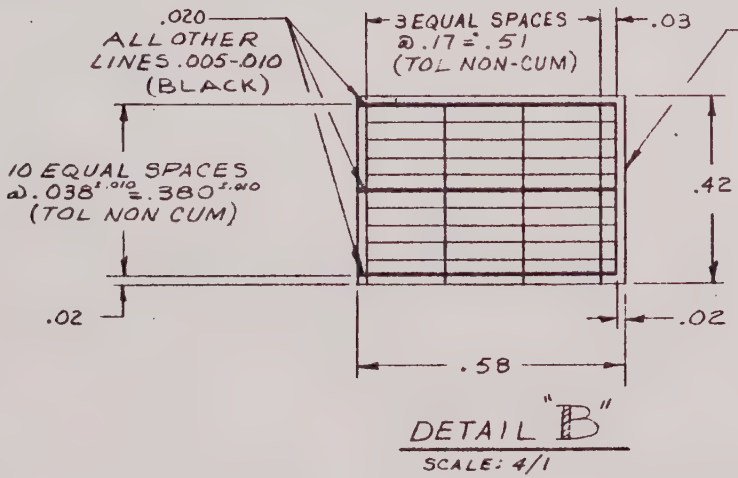
Form: E-101-2

B90-150 REV B



NOTES: (UNLESS OTHERWISE SPECIFIED)

1. MATERIAL: .003 TO .005 THK ANNEALED ALUM FOIL, PRESSURE SENSITIVE BACKING PER MIL-P-19834, (SOLVENT ACTIVATED FILM NOT ACCEPTABLE). ADHESION TO STEEL, 40 OZ/INCH OF WIDTH.
2. TEMPERATURE RANGE: -50°F TO +250°F.
3. ALL CHARACTERS TO BE 3/64 HIGH AND LOCATED APPROX. WHERE SHOWN.
4. LETTERING, PADS AND TRADEMARK BACKGROUND, TO BE SHINY ALUM ON A PERMANENT DULL BLACK BACKGROUND PER FED-STD-595 COLOR CHIP NO. 37038, BLACK CHARACTERS SAME COLOR AS BACKGROUND.
5. NAMEPLATE TO BE PRESERIALIZED, 1/16 HIGH, BLACK CHARACTERS, 5 CHARACTERS, ACTUAL SEQUENCE OF NUMBERS FURNISHED ON THE PURCHASE ORDER.
6. COVER ENTIRE NAMEPLATE WITH PROTECTIVE COATING OF CLEAR VARNISH.
7. TRADEMARK PER A80-269 EXCEPT COLORS PER FED-STD-595
   RED PER COLOR #31136
   BLACK PER COLOR #37038



DETAIL "B"
SCALE: 4/1

APR - 4 1968

REVISIONS

A	REVISED ENG. CORNER RADIUS WAS V16 R. ADDED NOTE 7	ECN-00-131	7-29-68 RDB
B	PER ECO 5260, 447 to 3, 2 to 1		1-5-69

USED ON	ASSY. DRWG.
1, 1A	

DIMENSIONS ARE IN INCHES
TOLERANCES
All 3 Place Decimal Dims. ± .003
All 2 Place Decimal Dims. ± .01
All Fractional Dims. ± 1/64
All Angles ± ½°
Unless Otherwise Specified

WEINSCHEL ENGINEERING
MANUFACTURERS CODE NO. 93459
GAITHERSBURG, MARYLAND

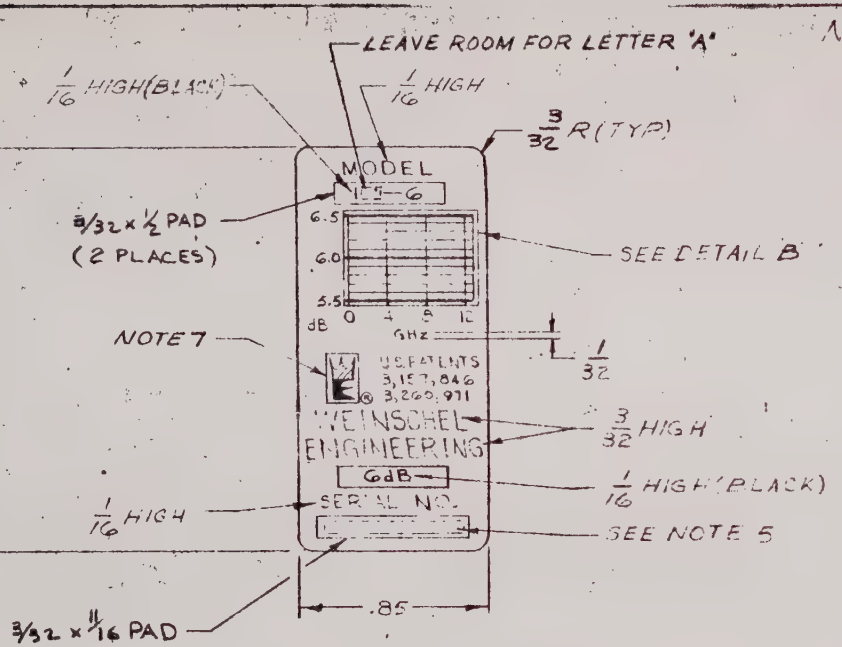
NAMEPLATE

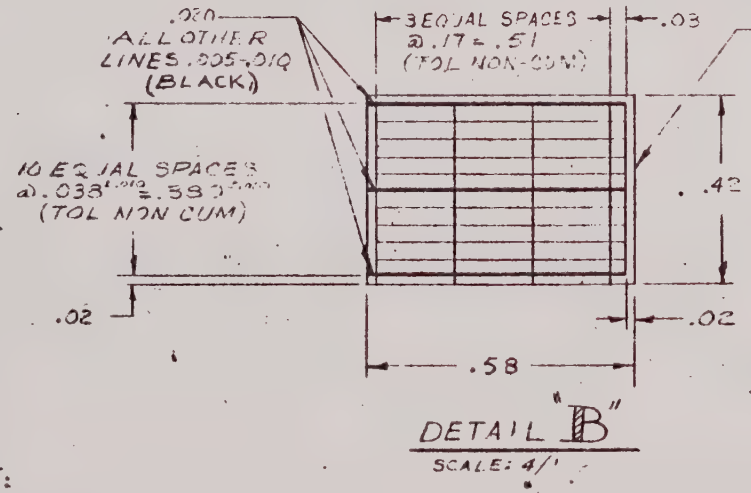
MATERIAL SEE NOTE 1
FINISH SEE NOTES 4 & 6

D	12/3/68	C RDK	12-3-68
E		A	1-5-69

SCALE 2/1

B90-150 REV B





DETAIL "B"
SCALE: 4/1

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. MATERIAL: .003 TO .005 THK ANNEALED ALUM FOIL, PRESSURE SENSITIVE BACKING PER MIL-P-19834, (SOLVENT ACTIVATED FILM NOT ACCEPTABLE). ADHESION TO STEEL, 40 OZ/INCH OF WIDTH.
2. TEMPERATURE RANGE: -50°F TO +250°F.
3. ALL CHARACTERS TO BE 3/64 HIGH AND LOCATED APPROX. WHERE SHOWN.
4. LETTERING, PADS AND TRADEMARK BACKGROUND TO BE SHINY ALUM ON A PERMANENT DULL BLACK BACKGROUND PER FED-STD-595 COLOR CHIP NO. 37038, BLACK CHARACTERS SAME COLOR AS BACKGROUND.
5. NAMEPLATE TO BE SERIALIZED, 1/16 HIGH, BLACK CHARACTERS, 5 CHARACTERS, ACTUAL SEQUENCE OF NUMBERS FURNISHED ON THE PURCHASE ORDER.
6. COVER ENTIRE NAMEPLATE WITH PROTECTIVE COATING OF CLEAR VARNISH.
7. TRADEMARK PER A80-269 EXCEPT COLORS PER FED-STD-595
   RED PER COLOR #31136
   BLACK PER COLOR #37038

APR 4 1977

REVISIONS		
	A	REVISED: ENG. CORNER RADIUS WAS .125-.249 ADDED NOTE 7 — KEB
	B	ECN 00-151 7-19-67 KEB ECN 00-151 12-4-67 KEB

USED ON	ASSY. DRWG.
1, 1A	

DIMENSIONS ARE IN INCHES
TOLERANCES
All 3 Place Decimal Dims. ± .003
All 2 Place Decimal Dims. ± .01
All Fractional Dims. ± 1/64
All Angles ± 1°
Unless Otherwise Specified

WEINSCHEL ENGINEERING
MANUFACTURERS CODE NO. 93459
GAITHERSBURG, MARYLAND

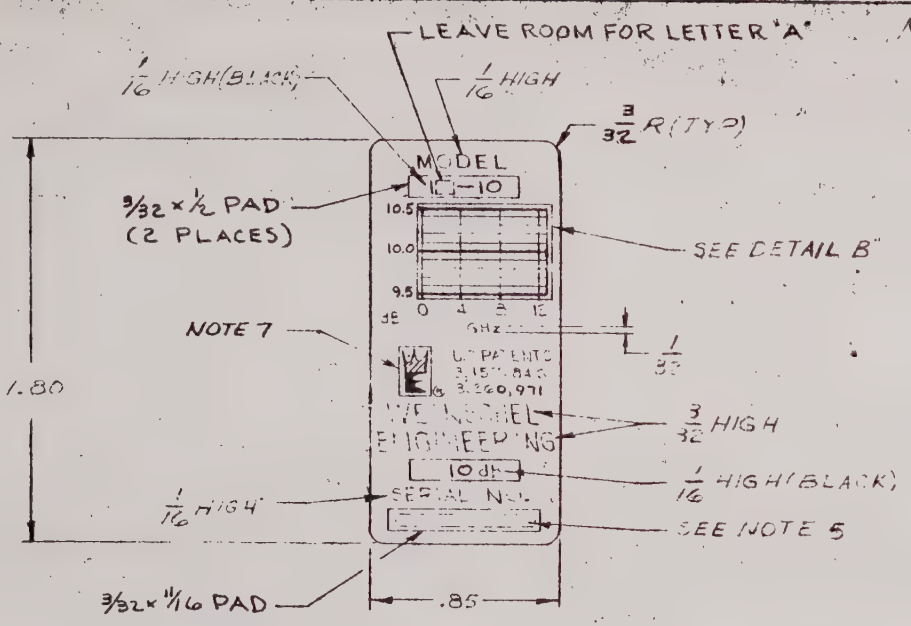
NAMEPLATE

MATERIAL SEE NOTE 1
FINISH SEE NOTE 4 & 6

D	C	SCALE 2/1
12/3/65	12-3-64	
KEB 12-4-64	A BCK 1-8-67	B90-151 REV B

B90-151 REV B

B90-152



NOTES: (UNLESS OTHERWISE SPECIFIED)

1. MATERIAL: .003 TO .005 THK ANNEALED ALUM FOIL. PRESSURE SENSITIVE BACKING PER MIL-P-19334. (SOLVENT ACTIVATED FILM NOT ACCEPTABLE). ADHESION TO STEEL, 40 OZ/INCH OF WIDTH.
2. TEMPERATURE RANGE: -55°F TO +250°F.
3. ALL CHARACTERS TO BE 3/64 HIGH AND LOCATED APPROX. WHERE SHOWN.
4. LETTERING, PADS AND TRADEMARK BACKGROUND TO BE SHINY ALUM ON A PERMANENT DULL BLACK BACKGROUND PER FED STD-595 COLOR CHIP NO. 37038, BLACK CHARACTERS SAME COLOR AS BACKGROUND.
5. NAMEPLATE TO BE PRESERIALIZED, 1/16 HIGH, BLACK CHARACTERS, 5 CHARACTERS, ACTUAL SEQUENCE OF NUMBERS FURNISHED ON THE PURCHASE ORDER.
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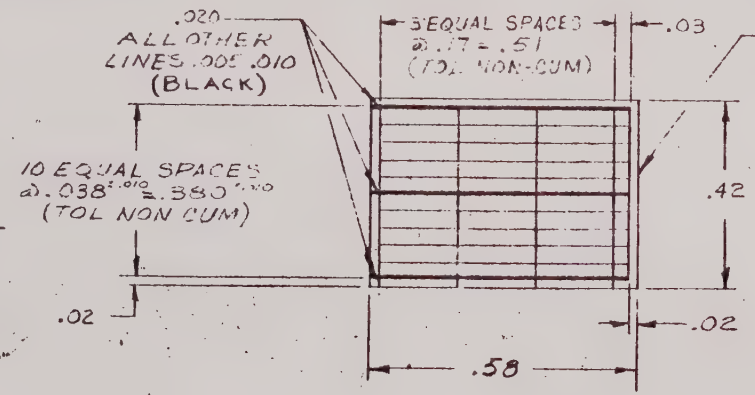
   BLACK PER COLOR #37038



DETAIL "B"
SCALE: 4/1

APR _ 4 1972

REVISIONS		
A	REVISED: ENG. CORNER RADIUS WAS V16R, 1-7-69 ADDED NOTE 7	
B	ECN 00418 2-25-69 BB Ref No 3,266,947 & 3,210,694	

USED ON	ABBY. DRWG.
1, 1A	

DIMENSIONS ARE IN INCHES
TOLERANCES
All 3 Place Decimal Dims. ± .003
All 2 Place Decimal Dims. ± .01
All Fractional Dims. ± 1/64
All Angles ± ½°
Unless Otherwise Specified

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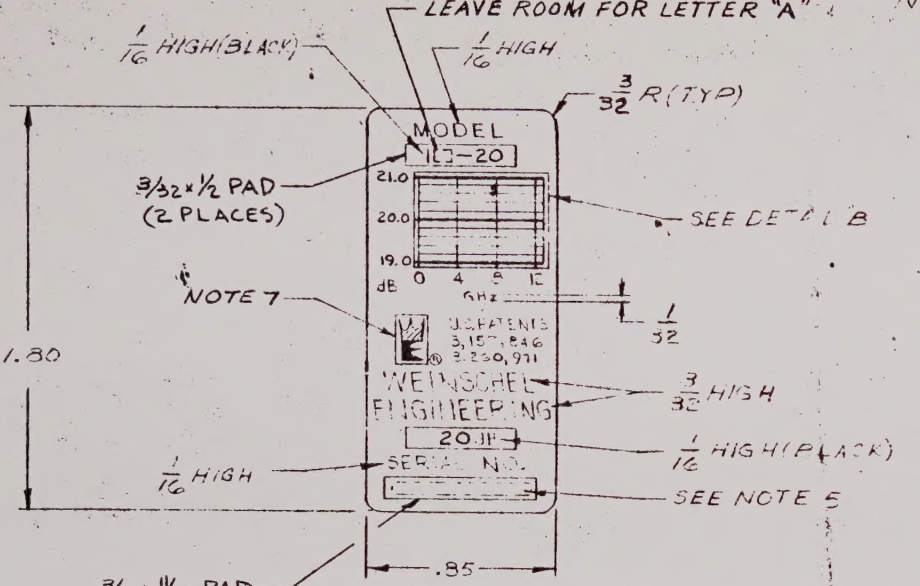
GAITHERSBURG, MARYLAND

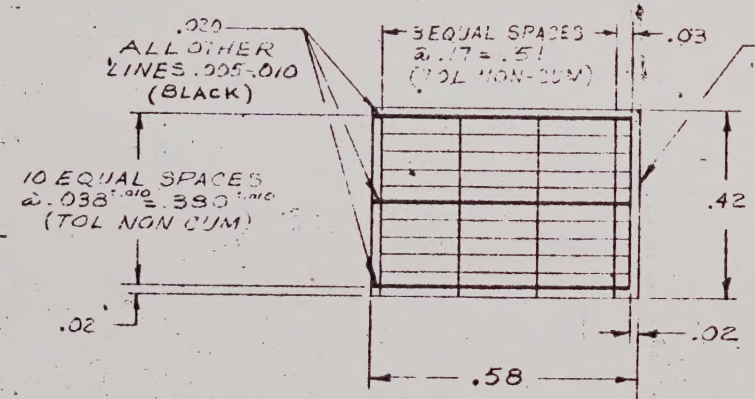
NAMEPLATE

MATERIAL SEE NOTE 1
FINISH SEE NOTE 4 & 6

D	C	SCALE 2/1
12/3/68	12-3-68	
E	A	B90-152 B
12-4-68	1-8-69	

B90-153 REV B





DETAIL "B"
SCALE: 4/1

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. MATERIAL: .003 TO .005 THK ANNEALED ALUM FOIL, PRESSURE SENSITIVE BACKING PER MIL-P-113834, (SOLVENT ACTIVATED FILM NOT ACCEPTABLE). ADHESION TO STEEL, 40 OZ/INCH OF WIDTH.
2. TEMPERATURE RANGE: -55°F TO +250°F.
3. ALL CHARACTERS TO BE 3/64 HIGH AND LOCATED APPROX. WHERE SHOWN.
4. LETTERING, PADS AND TRADEMARK BACKGROUND, TO BE SHINY ALUM ON A PERMANENT DULL BLACK BACKSIDE PER FED-STD-595 COLOR CHIP NO. 37038, BLACK CHARACTERS SAME COLOR AS BACKGROUND.
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6. COVER ENTIRE NAMEPLATE WITH PROTECTIVE COATING OF CLEAR VARNISH.
7. TRADEMARK PER ABO-269 EXCEPT COLORS PER FED-STD-595
   RED PER COLOR #31136
   BLACK PER COLOR #37038

REVISIONS

A	REVISED: ENG CORNER RADIUS WAS 1/16 R ADDED NOTE 7	1-19-68	RSB
B	ECN-00-131	7-22-69	GAB

USED ON	ASSY. DRWG.
1, 1A	

DIMENSIONS ARE IN INCHES
TOLERANCES
All 3 Place Decimal Dims. ± .003
All 2 Place Decimal Dims. ± .01
All Fractional Dims. ± 1/64
All Angles ± 1°
Unless Otherwise Specified

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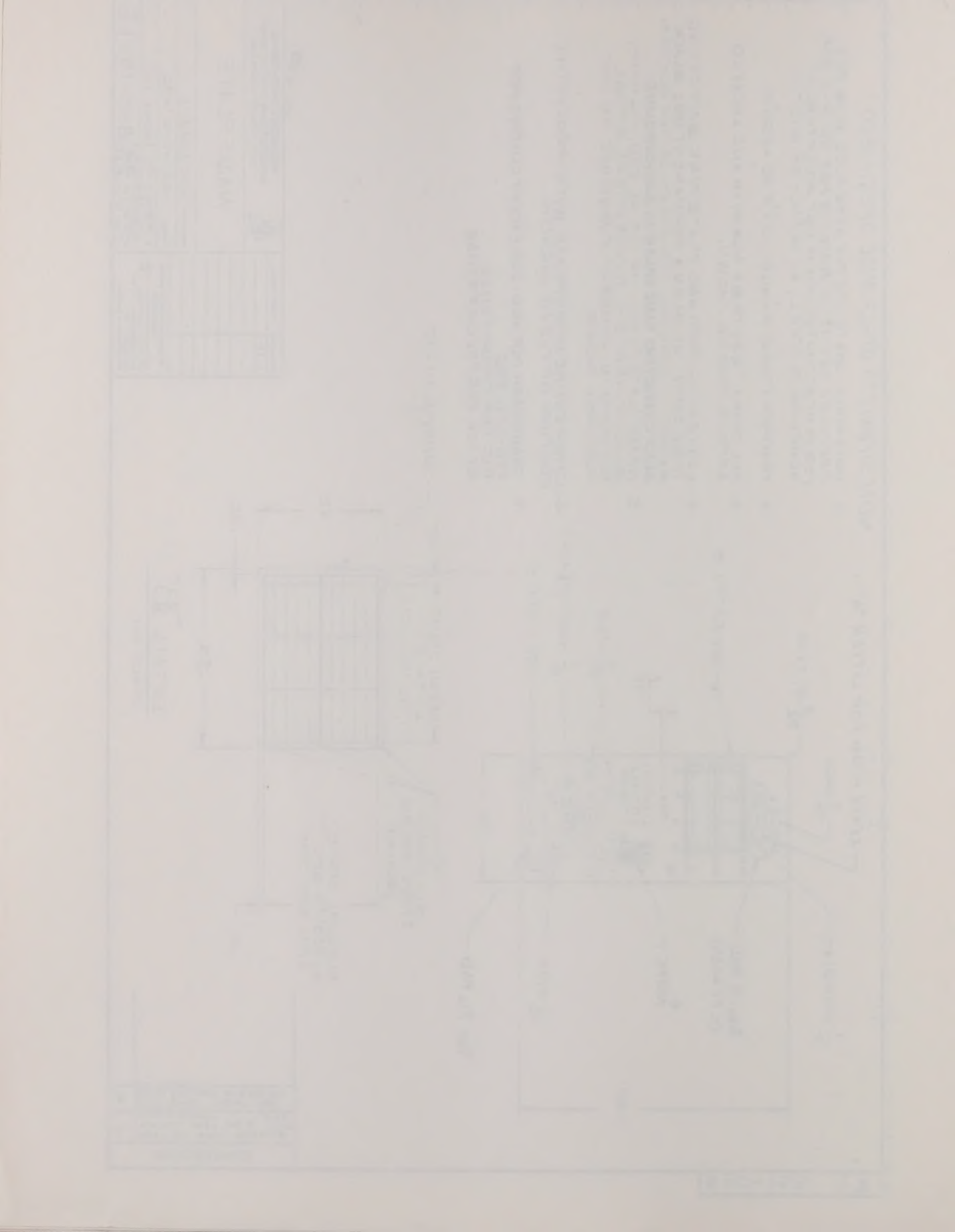
NAMEPLATE

MATERIAL SEE NOTE 1
FINISH SEE NOTE 4 & 6

DRAWN	12/3/63	CHECKED	12-3-68
ENGR	12-4-68	APPROVED	12-8-68

SCALE 2/1

B90-153 REV B



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